GRASSLANDS MANAGEMENT AND PLANNING PROJECT

Seg. 4 Amendment

July 2, 2013- July 31, 2017

SECTION 319 GRANT APPLICATION

OCTOBER 2014

SPONSORED BY

SOUTH DAKOTA GRASSLAND COALITION

SUBMITTED TO:

South Dakota Department of Environment and Natural Resources

AWARD FISCAL YEAR: 2014

PROJECT TITLE: Grassland Management and Planning Project Segment 4

NAME, ADDRESS, PHONE AND E-MAIL OF LEAD PROJECT SPONSOR:

South Dakota Grassland Coalition
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Primary Contact: Justin Jessop Phone: 605-280-0127

PROJECT TYPE: Watershed

PROJECT LOCATION: State wide

WATERSHED NAME: State wide

HYDROLOGIC UNIT CODE (HUC): State wide

HIGH PRIORITY WATERSHED: Yes **POLLUTANT TYPE:** Nutrients, Sediment, and Fecal Coliform Bacteria

UWA CATEGORY:

TMDL DEVELOPMENT: See Table 3 **TMDL IMPLEMENTATION:** See Table 3

TMDL PRIORITY (High, Medium, Low): High

WATERBODY TYPES: Lakes, Streams, and Wetlands

ECOREGION: State wide

PROJECT CATEGORY: Agricultural

PROJECT FUNCTIONAL CATEGORY: BMP Implementation/Design

GROUNDWATER PROTECTION: No

Total 319 Funds: $201,000 ($ 462,077) Local and State Match: $431,500 ($ 316,500)

Nonmatching Federal funds: $232,375 ($175,000)

319 Funded Full Time Personnel: 1.6 Total Project Cost: $ 864,875 ($953,577)

GOALS:

The goals of the Grassland Management and Planning Project are:

1. Reduce sediment, nutrients and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition on grasslands.
2. Develop standardized and repeatable methodology to assess South Dakotas remaining native grasslands that can be adapted to other regions of the Great Plains in order to measure impacts of grassland conversion on conservation of ranching, habitat, and watersheds.

By attaining these goals, water quality and wildlife habitat will be improved, biodiversity increased, and grassland manager economic sustainability improved.

The goals will be attained by providing technical assistance to grassland managers for the planning and implementation of grassland management systems, the completion of an information and education program on grassland management, a GIS layer of remaining native grasslands of South Dakota, and watershed modeling of "what if" scenarios of grassland-to-cropland conversion in hopes of identifying and applying grassland protection in key areas of the state.

PROJECT DESCRIPTION:

The project is a two year continuation of the current statewide Grassland Management and Planning project. During this project segment the sponsor and its partners will:

1. Provide grassland managers with accelerated technical assistance to plan an additional:
   a. 160,000 acres of intensive grassland management systems implement and
   b. 120,000 acres of intensive grassland management systems.
2. Transfer grassland management information gained from on-ranch demonstration projects and systems implemented to ranchers, researchers, agency specialists and the public.
3. Assess native grassland in South Dakota and Minnesota through a five-phased project
   a. Evaluate and map untilled sod in portions of 17 counties comprising the Prairie Coteau region of South Dakota (completed June 2014)
   b. Evaluate and map native grassland in portions of 11 counties comprising the Prairie Coteau region of Minnesota
   c. Evaluate and map native grassland in portions of 9 counties comprising the Missouri Coteau region of South Dakota
   d. Evaluate and map native grassland sod in the remaining 44 counties of eastern South Dakota
   e. Evaluate and map untilled sod in the 22 counties of western South Dakota
4. Inform the public and grassland managers about environmental impacts of grassland depletion.
5. Assess hydrologic and water quality impacts of grassland losses.

Planning and implementation assistance will be provided using the following priority and estimated allocation of resources that follow:

1. Grassland managers in TMDL implementation project areas where additional technical assistance to plan and implement improved grassland and riparian management are critical to implementing the TMDL - 50 percent.

2. Belle Fourche River Watershed TMDL Implementation Project - 40 percent.
3. Central SD where grassland conversion to cropland is occurring at an accelerating rate and areas of the state, i.e. eastern and southeast SD, where managed grazing has a history of limited implementation by landowners – 10 percent.
4. Mapping of native grassland will occur in sequence as described in section 3 above, beginning with completion of the Prairie Coteau and Missouri Coteau landscapes and ending with SD west river counties. As areas of native grassland are completed and mapped, the watershed modeling portion of the project will ensue based on the native grassland data.
5. Watershed modeling will describe "what if" scenarios based on converting the native grassland to crop production with varying degrees of conservation practices applied.

2.0 Statement of Need - Objective 1: Reduce sediment, nutrients and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition on grasslands.

This project segment will continue the South Dakota Grassland Coalition's (SDGLC) leadership in providing South Dakota livestock producers with practices that reduce nonpoint source (NPS) pollution from grasslands and promote sustainable agricultural.

Nearly fifty percent (23 million acres) of South Dakota's of 48,614,000 acres of land are grasslands. According to the Census of Agriculture, approximately 75 percent of the state's (= 23,000) farm/ranch operations graze livestock. The stock raised is the primary source of income for approximately 12,000 of the operations.

The sustainability of a farm/ranch enterprise based on grazing is directly related to the stocking rates its pastures can support without reducing forage production capability. Whether forage production decreases, is maintained or improved is dependent on the management practices employed by the producer.

Resource managers categorize grasslands using similarity index that compares forage production at a site to what the potential plant community could produce at its historic climax. The comparison values range from 0 – 100 percent with 100 percent being the most similar to climax production According to data provided by the USDA Natural Resources Conservation Service's (NRCS) National Resource Inventory (NRI) of South Dakota rangelands, approximately:

- 60 percent are at 50 percent or less potential
- 28 percent at 75 - 50 percent of potential and
- 12 percent at potential.

Continuous or season-long grazing, coupled with stocking rates greater than the forage produced can support, has been linked to degraded riparian areas and low ecological status. Conversely, management systems that include proper stocking rates and rotational grazing promote functioning riparian systems and higher range ecological status.

In contrast to rangelands with lower ecological status, high ecological status rangelands:

- provide greater biodiversity,
- produce more and better quality forage,
- raise more pounds of marketable livestock/animal unit, which translates to increased economic stability for the operation,
- provide better wildlife habit,
- yield 25 percent of the precipitation received as runoff (Welch et.al, 1991) versus 45 percent for low condition sites dominated by sod forming grasses, and 75 percent for bare ground,
- have sediment peaks at least 20 percent lower than those from low condition grasslands,
- characteristically have less prominent gullies, headcuts and streambank erosion and
- contribute up to four times less nitrogen and phosphorus to the watershed.

Based the findings of Russell (2004, Iowa Beef Center) and Thelen (1996, Bad River Phase II Water Quality Project), reducing NPS pollution from grasslands may be accomplished by maintaining or improving rangelands to a higher ecological status.

Russell reported that sediment and phosphorus loads in pasture runoff can be reduced using rotational stocking to maintain adequate grass height, and/or maintaining buffer strips along pasture streams. This being particularly important in pastures with high soil phosphorus levels.

Thelen's study of the impact of grassland management on sediment transfer from clay soils found that:

- as grass production, percent canopy cover, vegetation height, and litter increase, runoff and sediment transfer decrease,
- sediment peaks were six to eight times higher for poor condition (low ecological status) grasslands than good and
- gullies and headcuts are accelerated in poor condition grasslands dominated by short grasses.

Practices implemented during previous (2001-2013) and the current two year project segment have provided livestock producers with management alternatives that implement practices Russell and Thelen found to be effective NPS reduction best management practices (BMPs).

The activities completed during previous project segments have met, exceeded or are on schedule to meet milestones established to monitor project success (Table 1). The benchmarks include planning and implementing managed grazing systems using USDA Natural Resource Conservation Service (NRCS) practices and information transfer activities selected to reach the project's primary targeted stakeholders - livestock grazers and grassland management professionals

Table 1. Grassland Management and Planning Project Milestone Comparison (2001-2014).

Project Activity/Products	Planned	Accomplished[1]
Management Systems Planned/Total Acres	205 Systems / 515,000 acres	173 systems /589,644 acres
Management Systems Installed/Total Acres	202 /720,000 acres	166 / 768,470 acres[2]
Practices Installed:		
Fencing	425,000 lf	506,330 lf
Pipeline	335,000 lf	468,430 lf
Wells	14	5
Tanks	120	183
Pasture Pumps	5	0
Dugouts/Dams	20	6
Stream Crossing	1	1
Grass Seeding	950 acres	985 acres
Information and Education		
Demonstrations Sites	9	12
Web Site	280,000 hits	355,931 Hits
Tours/Attendants	25/1,680	60/1,903
News/Media Events	29/942,800	100/3,444,106
5 program series aired on Today's Ag Series segments merged into a video.	1	1
Workshops/Attendance	27/1,230	78/15,181
Grazing Schools/Attendance	10/260	13/400
Administration and Oversight	4	4

[1] Accomplished through 8/31/2013 [2] Includes acres planned by project partners.

The practices installed have improved the ecological status of an estimated one million acres (4 percent) of the state's grasslands. It is also estimated that the information and education activities have lead to improved ecological status of an equal number of acres.

In addition, information included in the 2008 and 2012 *SD Integrated Report for Surface W*aters indicate that during the four year time period, the river and stream miles identified as impaired by grazing in riparian or shoreline zones decreased from 561 to 475 miles. During this same period, the river and stream miles impaired from pollutants originating from livestock grazing and feeding operations decreased from 1,750 to 1,350 miles. Information in the 2002, 2008 and 2012 reports indicate river and stream miles impaired by pollutants associated with grazing in riparian and upland areas decreased from 2,151 to 562 miles.

A comparison of data available in the 2012 report to that in the 2014 indicates that impairments attributed to livestock grazing and feeding operations was reduced from 1,912 to 1,684 miles and the number of lake/reservoir acres impaired by NPS' was reduced from 4,517 to 4,411 acres.

NPS load reductions realized from the practices installed to improve and maintain higher levels of range potential during previous and the current (Segment 4) projects, calculated using the Spreadsheet Tool for Estimating for Pollutant Loads (STEPL) developed by EPA Region 5, equal:

- Nitrogen 637,741 lbs
- Phosphorous 114,912 lbs
- Sediment 71,329 tons

Practices employed to realize the reductions were installed on a total of nearly one million acres located:

- in more than 90 drainages
- on land managed by more than 200 producers
- located in more than 40 counties.

The size of the managed grazing systems implemented ranged from 30 to more than 31,500 acres.

Previous project accomplishments demonstrate the ability of the SD Grassland Coalition to partner and coordinate activities with grassland stakeholders that provide effective, efficient services that reduce NPS pollution and have positive economic and environmental benefit. In addition, it is suggested that the partnerships developed can serve as the basis for implementing the recommendations outlined in the SD Governor's Pheasant Habitat Work Group final report. The report is available by accessing:

http://gfp.sd.gov/pheasantsummit/docs/PHWG%20Final%20Report.pdf

Requests for planning and implementation assistance that are on hand and continue to be received indicate continued interest in using planned grazing systems to increase environmental stewardship and improve or stabilize a farm/ranch operation's economic viability.

The types of systems most commonly identified to accomplish these objectives are rotational systems that vary in management intensity - from simple two pasture switchback systems, to complicated multi-pasture rapid rotations. The water quality improvements realized from riparian buffers, shoreline stabilization, and livestock management (livestock exclusion, animal feeding areas) installed as the systems are developed are dependent on proper grazing management in the pasture, subwatershed area, and/or watershed associated with the site of BMP installation.

Implementation of new or improving current grazing management systems will be delayed in South Dakota without the availability of the grassland specialists employed by this project and its partner's to continue providing the information and technical assistance needed to plan, implement, and operate managed grazing systems.

The South Dakota NPS Pollution Program priority funding areas include staffing, information transfer, animal nutrient management systems, riparian buffers, shoreline stabilization, and practices to exclude livestock from riparian areas. This project segment will continue to provide the grassland planning, implementation, and education activities necessary to effectively implement these funding priorities as part of the need for a landscape planning approach to reduces NPS pollution in South Dakota.

The project addresses a key watershed BMP, grassland management. It provides existing watershed projects with technical assistance and information that can be used to make targeted, measurable water quality improvements through improved grassland management. The planning, design, and implementation of grassland management systems will be based on whole farm/ranch plans that incorporate the goals of the individual producers. Factors addressed in the plans include family, production, natural resources, and finances.

This project is designed to meet the clean water, economic and wildlife goals of grassland managers and the citizens of South Dakota on a statewide basis, by accelerating the implementation of grassland management practices that improve plant diversity, net primary production and forage quality. These practices will lead to attaining the project goal by:

1. Reducing soil erosion and sediment transfer in runoff through:
   a. increased water intake - reduced runoff reduces stream and river peak flow volumes and velocities, which in turn reduces stream bank erosion and abnormally long periods of flooding that damage wildlife habitat and
   b. rainfall interception - soil anchoring and ground protection by vegetation decreases the dislodging of soil and subsequent transport in runoff.
2. Providing a buffer adjacent to wetlands, lakes, waterways and drainages to intercept sediment and nutrients transported by water.
3. Increasing vegetation production on grasslands, which will increase the sequestration of carbon in the grassland ecosystem.
4. Providing producers with additional profits from increased livestock or wildlife production, and/or decreased production costs.
5. Assist producers and agencies in improving information related to the occurrence of native grasslands and their function in regard to: biological diversity, resiliency, economics, and water quality.

Completing activities that result in attaining the project goal will also support attaining the goal of the South Dakota NPS Management Plan. Management plan tasks supported include 4, 5, 8, 10 12 and 14.

A copy of the SD NPS Management Plan is available by accessing;

http://denr.sd.gov/dfta/wp/NPSMgmtPlan07.pdf

Information describing how previous Grassland Management and Planning Project segments have supported attaining the state's NPS management plan is available by accessing;

http://denr.sd.gov/dfta/wp/wqprojects/grasslands.pdf

Statement of Need - Objective 2: Develop standardized and repeatable methodology to assess South Dakotas remaining native grasslands that can be adapted to other regions of the Great Plains in order to measure impacts of grassland conversion on conservation of ranching, habitat, and watersheds.

South Dakota is losing its perennial grassland cover at a rate that is concerning to many individuals and organizations. The statewide rate of grassland loss, while likely measurable, has not been quantified in regard to actual loss of *native* grasslands.

Currently, there exists no singular accurate source of data or maps that indicate the location or land area of truly native sod in South Dakota or western Minnesota. This region of the upper plains has experienced some of the highest rates of conversion to row crop agriculture over the last decade. While several recent studies have addressed the issue conversion of grassland habitats to cropland based on

known data sets (such as NASS data), there exists no data on the portion of grassland conversion that is truly native sod.

Most studies attempting to quantify land use change have utilized some type of GIS remote sensing or other technology to derive at a conversion rate. Most typically, studies rely on the National Agricultural Statistics Service's (NASS) Cropland Data Layer (CDL) to report total acres 'lost' or a percent change over a period of time (Wright and Wimberly 2013; Johnston 2013, 2014; Faber et al. 2012, Decision Innovation Solutions 2013). This type of analysis can be very powerful in reporting land use trends, but because researchers have not been able to accurately and consistently separate native grasslands from other types of planted grasslands (such as CRP), grass-like crops (such as hayfields), or other grassy habitats using NASS CDL data, it becomes nearly impossible to accurately map vegetation type at a meaningful scale.

Decision Innovation Solutions (2013) addressed the issue of error in land covers reported by NASS CDL data, especially in relation to those that are "more grassy in nature". Typically, analysts group most or all of the following NASS CDL cover categories together under a 'grass' or 'grass-like' label for analysis: 36-alfalfa, 37-other hay/non-alfalfa, 62-pasture/grass, 87-wetlands, 171-grassland herbaceous, 181-pasture/hay, and 195-herbaceous wetlands. However, Johnston (2013) also found that NASS CDL data even confused corn crops with cattail sloughs. These issues with interpretation of NASS CDL data render it impossible to quantify acreage and location of undisturbed land or native sod with any confidence. Reitsma et al (2014) attempted to quantify conversion using aerial imagery to verify NASS data, and concluded that roughly 1.8 million acres of grasslands were converted in South Dakota between 2006-2012. While promising in relation to providing accuracy in conversion rates, this study did not attempt to quantify the impacts of conversion on native grasslands.

The objective of our work is to develop a simple, systematic, repeatable, and cost-effective approach to estimating location and total area of land tracts that are likely undisturbed (i.e. native) grasslands and woodlands. The central component to our analysis was the utilization of the 2012 South Dakota Farm Service Agency's (FSA) Common Land Unit (CLU) cropland data layer.

Our recent pilot project in the Prairie Coteau region of eastern South Dakota suggests that nearly 50% of the existing remaining native grassland is not included in regional estimates while those tracts that are included are themselves only likely about 50% accurate. Our system of analysis will result in the most comprehensive and accurate analysis to date and will likely serve as an important tool for conservation and agricultural programs and policies.

With our methods, we estimated there are approximately 1,102,271 acres of undisturbed grasslands and woodlands remaining representing (20.3%) of the 5,434,508 total acres within the South Dakota Prairie Coteau Boundary. Of these 1,102,271 remnant undisturbed acres, 1,065,262 acres (96.6%) are classified as 'undisturbed grasslands' and 37,009 acres (3.4%) are 'undisturbed woodlands'. Approximately 276,184 acres (25.1%) of undisturbed grasslands and woodlands are permanently protected from conversion through conservation ownership or permanent conservation easements, representing 5.1% of the 5,434,508 total SD Prairie Coteau Acres.

Going forward, we propose to continue this project in phases, with each phase focused on a certain landscape our block of counties in South Dakota and Minnesota until we have completed mapping all 66

South Dakota counties and the 11 counties comprising the remainder of the Prairie Coteau landscape in western Minnesota. Further, we intend to incorporate landscape-level watershed modeling on at least three watersheds to determine the environmental impacts of continued grassland loss in relation to runoff, soil erosion, and water quality. Watersheds will be selected based on the results from the grassland mapping project and will likely include one cross-border watershed in the Prairie Coteau region of eastern South Dakota and western Minnesota, one in the Missouri Coteau region of northcentral South Dakota, and one in northwestern South Dakota's range country. (For a full description of the methods that will be employed in the mapping project, see the project report ***Quantifying Undisturbed Land on South Dakota's Prairie Coteau*** attached).

There is a scarcity of scientific information that documents how grassland losses affect hydrology and water quality in South Dakota. This study is proposed to help provide understanding of hydrologic implications of accelerating grassland conversion.

2.4 General Watershed and Grassland Information

Except for two small areas in the northeastern corner of the state which are in the Red River and Minnesota River Watersheds, South Dakota is in the Missouri River watershed.

Western South Dakota is drained by six major rivers - Bad, Cheyenne, Belle Fourche, White, Moreau, and Grand - which flow west to east to the Missouri River. The area, which was not glaciated during the last ice age, is dominated by rolling, native grasslands with as little as 10–30 percent of many areas converted to crop production. While the traditional crops planted were forage crops, hay and wheat; the production of row crops has increased during recent years as no till practices have become the production system of choice and commodity prices risen to what may be historic highs.

The major rivers in eastern South Dakota - James, Vermillion, and Big Sioux - generally flow north to south to the Missouri River. Unlike the west, the topography was influenced by glacial activity. Eastern SD has less defined drainage patterns with numerous natural wetlands and lakes. Much of the native prairie has been converted to cropland which is mostly cropped using a corn – soybean rotation.
Moving east from the Missouri River and toward the southeast corner of the state, row crop production increases from 20 to 80 percent of land use. Likewise, grasslands decrease in prevalence and become increasingly concentrated along streams, creeks, rivers, and wetlands.

Grasslands commonly occupy 70-90 percent of the land in western South Dakota watersheds. In eastern SD, grasslands cover from 20 to 80 percent a watershed with lower values being the norm. While lesser in extent in eastern SD, grasslands commonly occupy the environmentally sensitive lands adjacent to streams, wetlands, lakes, and rivers, where they cover riparian areas and sloping drainages, hills and/or breaks. Regardless of extent by region, grasslands in all parts of SD impact runoff volume and are the buffers that intercept pollutants carried by runoff and protect stream banks. Grasslands also provide habitat (nesting, winter cover, food, and reproductive range, etc.) for South Dakota's wildlife.

Central SD, essentially west of highway 281 to the Missouri River, was traditionally dominated by diversified agriculture with producers involved with livestock production to an increasing degree with closer proximity to the 100^{th} meridian. During recent years there has been an increasing shift toward row crop production. For example, during 2005 – 2006, 101,571 acres of grasslands in 16 counties in

the area were converted to crop production (GAO-07-1054, September 2007). Visual observations and information relative to payment for lost production provided by the livestock producers and resource managers and the crop insurance industry, respectively, indicate the rate has accelerated since that time with a concern that claims filed/paid are disproportionate to other areas in the state and region.

Data presented to the SD Governor's Pheasant Habitat Work Group by South Dakota State University showed the acres of grassland converted to cropland, inundated by water or lost to urban development the 2006 – 2012 time period totals 1.8 million acres.

The river and stream miles and acres of lakes identified as having impaired water quality and the source of impairment are shown in the Table 2. As discussed previously (Project Description information included in the 2008 and 2012 *SD Integrated Report for Surface W*aters indicate that during the four year time period, the river and stream miles identified as impaired by grazing in riparian or shoreline zones decreased from 561 to 475. During this same period, the river and stream miles impaired from pollutants originating from livestock grazing and feeding operations decreased from 1,750 to 1,350. Information in the 2002, 2008 and 2012 reports indicate river and stream miles impaired by pollutants associated with grazing in riparian and upland areas decreased from 2,151 to 562.

A comparison of data available in the 2012 report to that in the 2014, the impairments attributed to livestock grazing and feeding operations was reduced from 1,912 to 1,684 miles and the number of lake/reservoir acres impaired by nonpoint sources was reduced from 4,517 to 4,411 acres. A comparison of the 2012 to 2014 data also indicates the proportion of river/stream miles impaired by livestock related nonpoint source pollutants declined an additional three percent, from approximately the 40 percent to 37. The primary pollutants identified as the cause of impairment were total suspended solids (TSS) and fecal coliform bacteria.

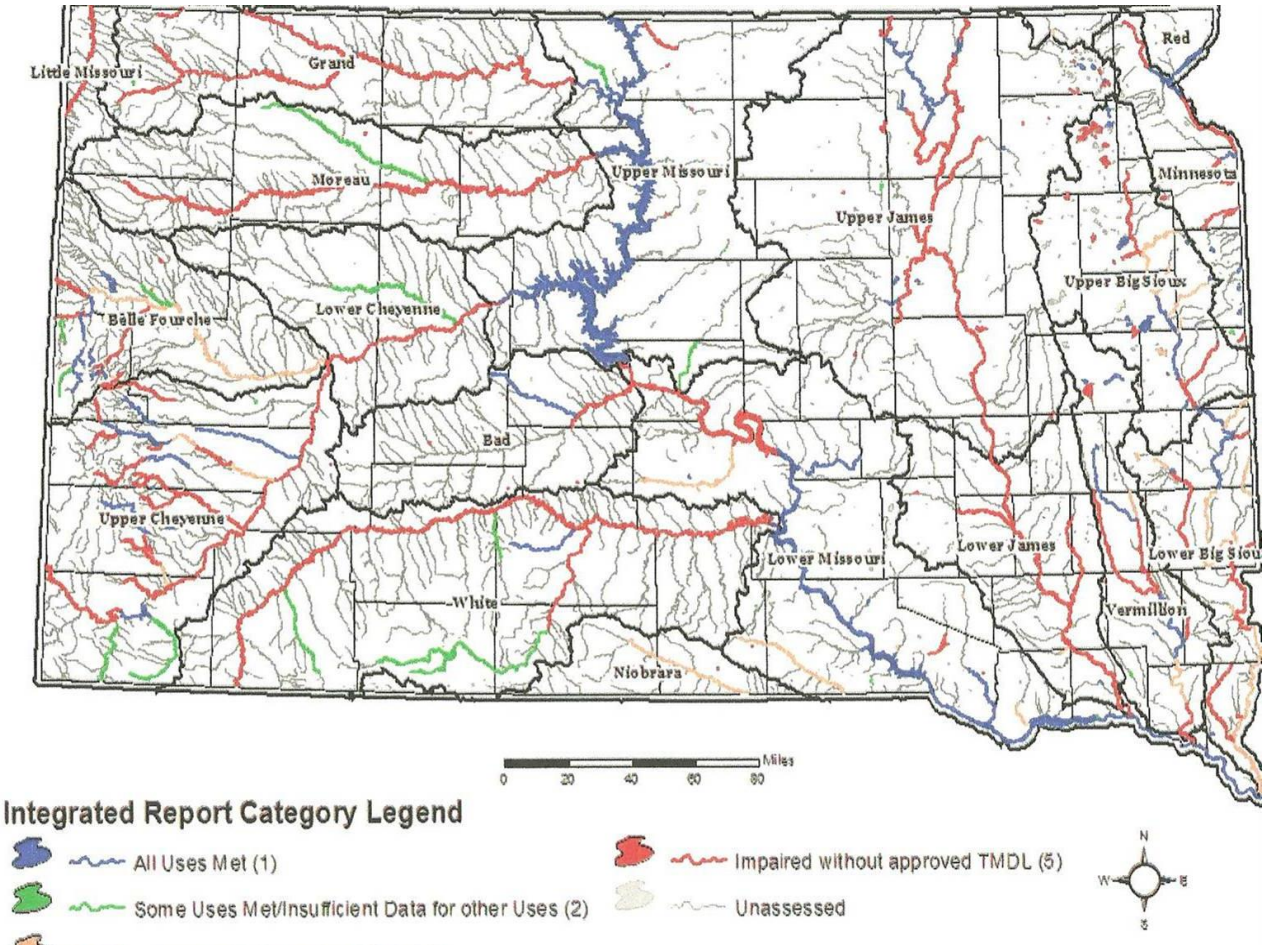
The map that follows (Figure 1) shows the river segments and/or lakes that require development of and/or implementation of Total Maximum Daily Loads (TMDLs). Grasslands, because of their extent and critical location in relation to the listed water bodies, are commonly targeted for BMP installation in South Dakota watershed implementation projects (Figure 2). The location of grazing systems installed during the previous and current project segments are shown in Figure 3.

Table 2: Total Sizes of Waters Impaired by Various Source Categories in SD[1]

Rivers/Streams	Miles[2]
Impacts from Abandoned Mines	2
Drought-related Impacts	25
Streambank Modifications/destabilization	77
Municipal Area or Urban Runoff	117
Unknown Sources	127
Wildlife	508
Agricultural Crop Production	865
Natural Sources	1,110
Livestock -Grazing or Feeding	1,684
Lakes/Reservoirs	**Acres**
Unknown Sources	3,073
Nonpoint Sources	4,411
Natural Sources	5,125

[1] 2014 SD Integrated Report for Surface Water

[2] Mileage values rounded to the nearest whole number.



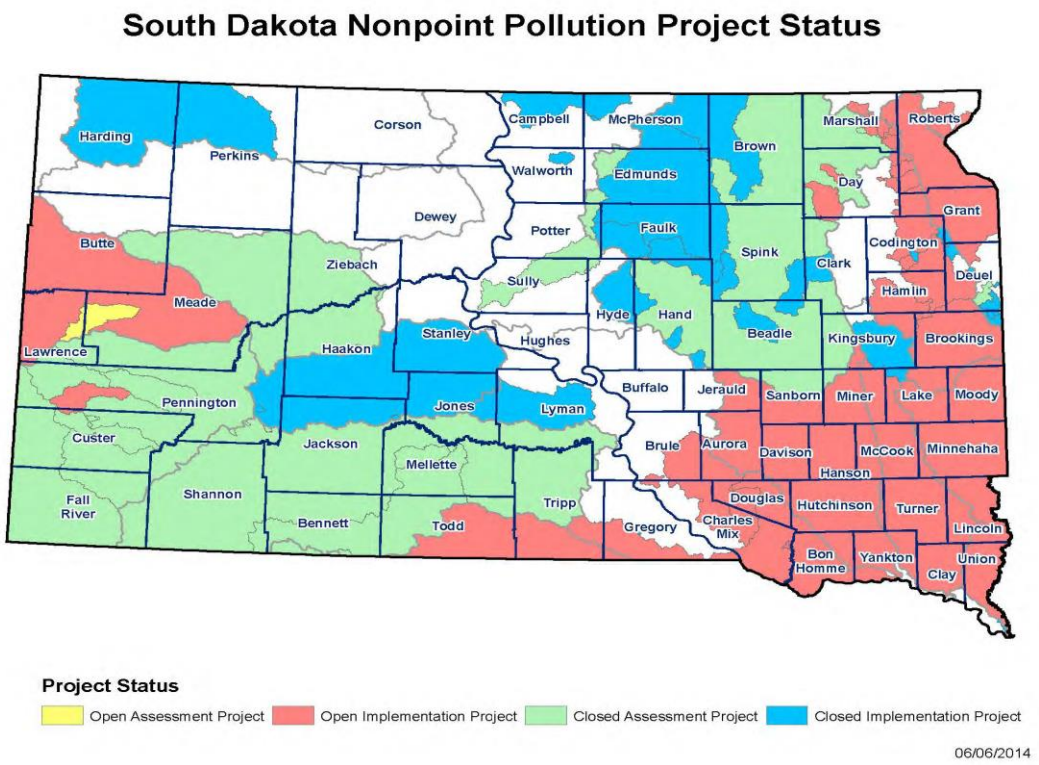


Figure 2. South Dakota TMDL Development and Implementation Status.

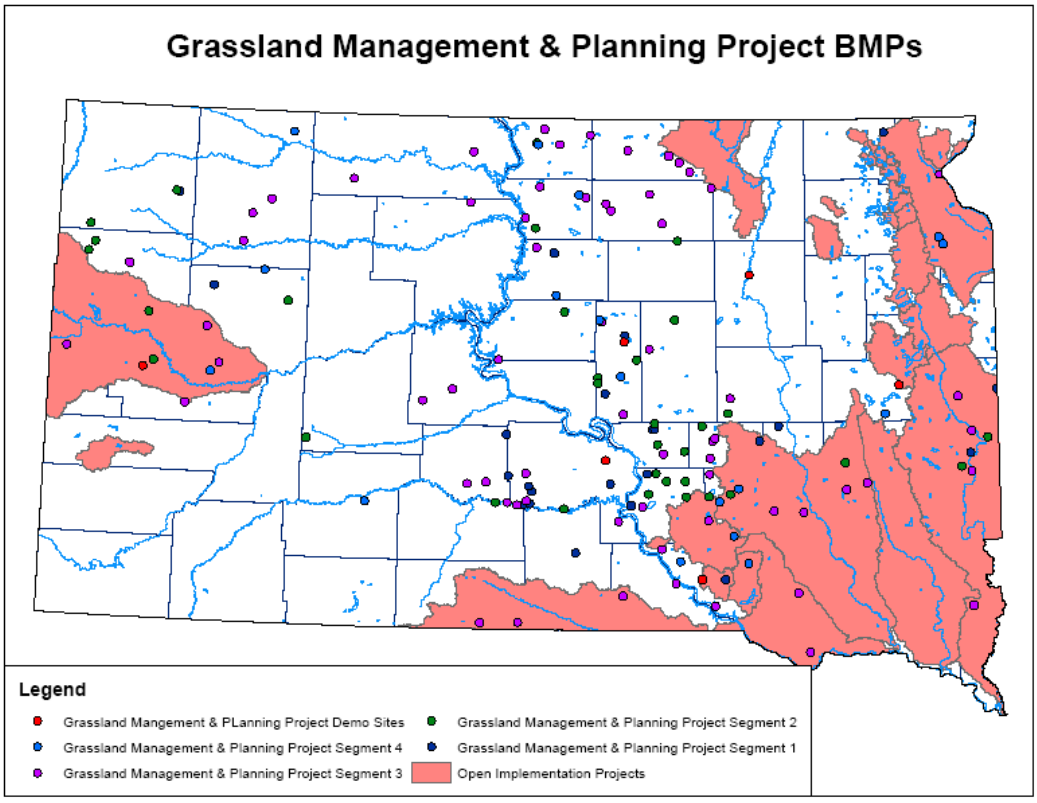


Figure 3. Location of Grazing systems Grazing Systems installed.

3.0. Project Description

The proposed project is a two year continuation of the current Grassland Management and Planning Project. Activities planned for this project segment will:

1. Provide grassland managers with assistance to plan 160,000 acres and implement 120,000 acres of managed grazing systems.
2. Transfer information gained from on-ranch demonstration sites and systems implemented that managed grazing offers producers a viable option for developing a sustainable agricultural enterprise using practices that promote resource conservation and environmental protection.
3. Determine the area and location of all potential native grassland remaining in South Dakota and western Minnesota through a five-phased analysis and mapping project.
4. Evaluate changes in hydrology and water quality associated with changes in the extent of South Dakota's grassland by simulating "what if" cases of grassland losses in three watersheds to illustrate the hydrologic implications for converting grass to crop lands using a watershed model.

As project sponsor, the South Dakota Grassland Coalition is responsible for completion of tasks selected to attain the project goal. The coalition will continue its management agreement with the South Dakota Association of Conservation Districts (SDACD) for implementation, evaluation and reporting service. . The services and personnel employed by SDACD to carry out the services include:

1. Administrative and management staff
   Accounting services, progress reports, hiring, training and supervising project staff and procure and maintain equipment, supplies, and vehicles.

2. Project Coordinator/Range Specialist
   Provide leadership, coordination, and technical assistance for all project activities; assist livestock producers with planning and installing managed grazing systems on approximately 60,000 acres.

3. Project Range Specialist
   Planning and implementation technical assistance to landowners for 120,000 acres of managed grazing.

4. Range Consultants, other agencies and TSPs
   Technical assistance providers contracted to provide planning and implementation technical assistance to landowners for 50,000 acres of grazing management.

5. Outreach Coordinator/Information Specialist.
   This position is 0.10 FTE of a South Dakota State University (SDSU) Department of Natural Resource Management staff person assigned to provide leadership to the Grassland Coalition and project staff for planning, and coordination of information transfer and outreach activities.

The project will continue funding technical assistance for the development of managed grazing system plans, and complete information transfer and outreach activities. Conservation practices considered

when planning grazing system are anticipated to include, are but not limited to, those associated with water development, building cross and riparian exclusion fences, stream crossings and seeding grasses.

Sources of financial assistance to implement the plans will be identified and arranged as part of the planning process. Programs that provided implementation funds during previous project segments and, are anticipated to continue doing so include:

- DENR Watershed Protection Program – US Environmental Protection Agency (EPA) Clean Water Act Section 319 Grant to South Dakota,
- USDA Farm Service Agency (FAS) - Conservation Reserve Program Continuous Signup (CCRP) and Marginal Pastureland Practice (CP30),
- USDA Natural Resource Conservation Service (NRCS) - Environmental Quality Incentives Program (EQIP) and Farm Bill Implementation Technical Assistance funds,
- SD Department of Agriculture (SDDA) - SD Soil and Water Conservation Grants awarded through the SD Conservation Commission,
- SD Game, Fish, and Parks (GFP) – Private Lands Habitat and Access Program,
- US Fish & Wildlife (FWS) - Annual appropriation for habitat development,
- Ducks Unlimited (DU) - BMP installation and sponsorship of Coalition activities,
- Pheasants Forever and
- World Wildlife fund.

In addition to the continuation of the management agreement with the South Dakota Association of Conservation Districts, the SD Grassland Coalition will expand the scope of its focus to include additional partnerships aimed at assessing the location and area of native grasslands while assessing the potential impacts of the loss of those grasslands on water quality. This additional focus will be administered through a partnership with South Dakota State University (SDSU) while employing funding from government and non-government organizations. The services and personnel that will be employed by SDSU to carry out the services include:

1. SDSU Extension Range Field Specialist

   The SDSU Extension Range Field Specialist position currently supports the South Dakota Grassland Coalition through a mutual partnership that includes roughly 20% time in organization and promotion of SDGC events, as well as other priorities. This expense is currently funded through SDSU. Under this grant, the Field Specialist will be additionally responsible for overall coordination of native grassland mapping and analysis project, including coordination of partner data, data management, supervision of two GIS technicians, and project deliverables. These additional duties will comprise 10% of this positions total time allocation will be dedicated to mapping project and funded through the grant request.

2. SDSU Senior Agricultural Research Technician

   This is a full time, term position that is responsible for daily project coordination, information gathering, mapping, and which serves as the lead technician for the project. 100% of this position's total time allocation is dedicated to the mapping project, and the position will be expanded to include the west river project area should the grant be awarded

3. SDSU Assistant Agricultural Research Technician

   This is a full time, term position that is responsible for project mapping and analysis and which serves as the assistant technician for the project. 100% of this position's total time allocation is dedicated to the mapping project, and the position will be expanded to include the west river project area should the grant be awarded

4. SDSU Grassland Hydrologist

   Responsible for the day to day administration and supervision of the modeling component of the proposed project. Will supervise a graduate research assistant, who will assist with the completion of modeling tasks. The value of this time investment will be recorded as match to the grant.

5. SDSU Graduate Student

   This position is the only 'new' position funded solely through this grant and will provide assistance to the Grassland Hydrologist for the completion of modeling tasks.

The grassland mapping and modeling projects will focus on new data and products developed through this grant. Partner organizations and sources of financial, in-kind, and data assistance are identified as follows:

- SD Grassland Coalition
- South Dakota State University Extension
- South Dakota State University College of Agriculture and Biological Sciences, Department of Natural Resource Management
- South Dakota State University Geographic Information Science Center of Excellence
- The Nature Conservancy
- Minnesota Department of Natural Resources
- Natural Resources Conservation Service (SD)
- Farm Services Agency (SD and MN)
- South Dakota Department of Game, Fish, and Parks
- Pheasants Forever
- US Fish and Wildlife Service
- National Fish and Wildlife Foundation funds (phase I – complete)

Information transfer and outreach activities planned include:

- grassland web site,
- SD Grazing Schools,
- grassland workshops,
- grassland birding workshops,

- Leopold Conservation Award recipient ranch tours and
- news releases/media events.

Requests for technical assistance will be accepted by referral from TMDL implementation project coordinators, landowners, conservation districts SDSU Cooperative Extension Service and NRCS field offices. The application for assistance procedure and forms are available by accessing:

http://www.sdconservation.org/grassland/managing/gmd/

Technical assistance will be delivered using the priority system adopted during previous project segments. The priorities and estimated allocation of project resources to each category are:

1. Grassland managers in TMDL implementation project areas where additional technical assistance to plan and implement improved grassland and riparian management are critical to implementing the TMDL - 50 percent.
2. Belle Fourche River Watershed TMDL Implementation Project - 40 percent.
3. Central SD where grassland conversion to cropland is occurring at an accelerating rate and areas of the state, i.e. eastern and southeast SD, where managed grazing has a history of limited implementation by landowners – 10 percent.

The GIS layer of native grasslands will be incorporated to better prioritize areas of assistance once data is available. Project staff will increase efforts to identifying and assisting historically underserved farmers and ranchers in the priority areas. Historically underserved farmer/rancher include:

- beginning farmer and/or rancher
- limited resource farmer and/or rancher
- socially disadvantaged farmer and/or rancher

Additionally, the native grasslands data layer will be made available to all public and private partners for program/project analysis and modifications including but not limited to USDA Conservation programs, SD Game, Fish, and Parks, US Fish and Wildlife Service, and others.

Partnerships with conservation districts, Section 319 projects and NRCS will:

- provide support services and guidance to project staff,
- identify and assist producers with requesting assistance and
- provide maps, soils data and existing farm plans.

NRCS will provide project staff with access to the *SD Field Office Technical Guide*. The guide may be accessed at:

http://www.sd.nrcs.usda.gov/technical/ConsPract.html

A report that includes load reductions as indicator of the impact of the project on nonpoint source pollution in South Dakota will be filed at the end of the project period.

Three watersheds will be used for the watershed analysis (**Figure 4**). Following mapping of native grasslands, the three watersheds will be selected in the Prairie Coteau (eastern South Dakota), Missouri

Coteau (north-central South Dakota), and Great Plains of western South Dakota, respectively. These locations are identified for the selection of the study watersheds not only because of the abundance of native grassland in these areas; but also these areas are representative of grass landscape in South Dakota, North Dakota, Minnesota, and the Corn Belt States.

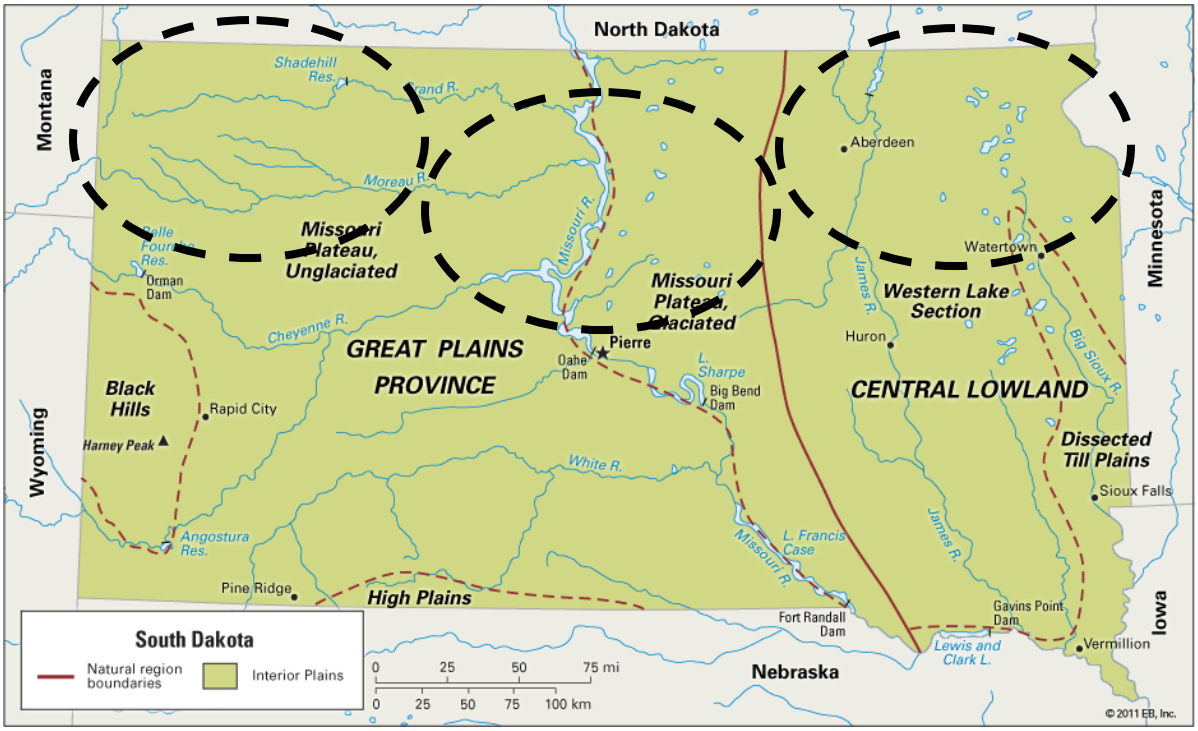


Figure 4. Map (Britannica.com) showing potential locations of the three watersheds selected for study. Locations are circled.

3.1 Project Goal

The first project goal is:

> Reduce sediment, nutrients and fecal coliform bacteria loading of surface waters in South Dakota by improving range condition on grasslands.

By attaining the goal, water quality and wildlife habitat will be improved, biodiversity increased, and grassland manager economic sustainability improved.

The goal will be attained by providing technical assistance to grassland managers for the planning and implementation of grassland management systems, the completion of an information and education program on grassland management, a GIS layer of remaining native grasslands of South Dakota, and watershed modeling of scenarios of grassland-to-cropland conversion to identify and better provide grassland protection strategies to key areas of the state.

3.2 Objectives and Tasks

Objective 1: Provide grassland managers with the technical assistance needed to plan 160,000 (160,000) acres of managed grazing systems, and complete the implementation of systems on an additional 120,000 (120,000) acres of grasslands by July 31, 2017.

Task 1: Provide livestock producers with the technical assistance needed to plan and operate grazing systems.

Product 1: Grazing Management Plans - 160,000 (160,000) grassland acres.

Project staff, and range consultants will plan 60,000 (60,000) acres of managed grazing systems (Prescribed Grazing – Practice Code 528). Of the remaining 100,000 (100,000) acres, 50,000 (50,000) acres will be planned by Belle Fourche River project staff and consultants and 50,000 (50,000) by other agency specialists and NRCS certified technical service providers (TSPs) respectively.

The planning process:

- begins with a resource inventory of the land that will be included in the system and determination of the producer's management philosophy and capabilities.
- uses methods and practices outlined in the *NRCS National Planning Procedures Handbook, National Range and Pasture Handbook, and the South Dakota Field Office Technical Guide,*
- includes development of alternative water sources to facilitate excluding grazing in riparian area and
- considers rural water hook up as the preferred alternative water source.

See Product 2 for the practices which are expected to be included in the plans developed.

Milestones:

- 15 grassland grazing system plans/year @ 2000 acres/plan x 2 (2) years = 60,000 (60,000) acres.
- 25 plans/year @ 2,000 acres/plan x 2 (2) years = 100,000 (100,000) acres.

Cost: The technical assistance costs are included in the project personnel costs. Costs include salaries, travel and consulting contracts.

Product 2: Install grassland management systems on 120,000 (120,000) acres of grasslands. The total includes

60,000 (60,000) acres planned by the project and 60,000 (60,000) acres planned project partners.

Financial assistance to install the practices will be provided by the SDGLC's project partners. As indicated previously, programs from which funds are anticipated include:

- TMDL Implementation Projects,
- FSA - CRP Program,
- NRCS - EQIP and Farm Bill Implementation Technical Assistance Programs,
- SDDA – SD Soil and Water Conservation Grant Program,
- SD GFP – Partners for Wildlife,
- US FWS – Annual Appropriation for SD,
- Ducks Unlimited,
- Pheasants Forever and
- World Wildlife Fund.

The practices and quantity of each and estimated cost to implement 120,000 (120,000) acres of managed grazing
systems are summarized in Table3.

Milestones: 60,000 (60,000) acres planned by project staff installed.
60,000 (60,000) acres planned by project partners installed.

Total Cost: Task 1, Product 2: $ 330,000 ($330,000) 319 Cost: $0 ($0.00)

Table 3. Conservation Practices Used to Install Managed Grazing Systems.

Practice	Practice Code	Units	Unit Cost ($)	Total ($)
Marginal Pastureland CRP	CP 30	250 acres	$50.00/acre	12,500
Fence - Cross & Riparian Exclusion	382 Cross Fence 390 Riparian Exclusion	80,000 feet 40,000 feet	$ 0.80/foot $1.10/foot	64,000 44,000
Pipeline	516 Pipeline	125,000 feet	1.60/foot	200,000
Rural Water Hook-ups	516 pipeline	2	4,000.00 each	8.000
Tanks	614 Watering Facility	40	1,200.00 each	8,000
Wells	642 Water Well	4	Large diameter - $76.00 - $91.00/ft. Artesian copper casement - $31.00 - $37.00/foot Artesian PVC casement - $16.00 - $19.00/foot Deep aquifer well > 6" diameter - $44.00 - $53.00/foot Plastic casement well > 100' - $22.00 - $27.00/ft. Shallow well < 100' -$3,000.00 - $3,600.00/well J 55 steel well - $27.00 - $32.00/well	150,000
Dams/Dugouts	378 Pond	6	$10,000.00 each	60,000
Stream Crossings	578	1	Concrete $61 – $73.00/foot Rock – $24 – $28.00/foot	3,500
Grass Seeding	512 Introduced Species 550-Native Species	500 acres	$40.00/acre $60.00/acre	25,000
Total				385,000

RESPONSIBLE AGENCIES (Products 1 and 2)

Technical Assistance Coordination:
Project Coordinator
South Dakota Association of Conservation Districts

Planning Assistance:
Project Coordinator/Range Consultant/Range Specialist
South Dakota Conservation Districts
Natural Resources Conservation Service
SD Department of Agriculture
South Dakota State University
SD Department of Game, Fish, and Parks
US Fish and Wildlife Service
NRCS certified TSPs
Pheasants Forever

Implementation:
Project Coordinator/Range Consultant/Range Specialist
South Dakota Conservation Districts
Natural Resources Conservation Service
SD Department of Agriculture
South Dakota State University
SD Department of Game, Fish, and Parks
US Fish and Wildlife Service
NRCS certified TSPs
Pheasants Forever
Farmers and Ranchers

Financial Assistance:
USDA Farm Service Agency
Natural Resources Conservation Service
TMDL Implementation Projects
SD Department of Agriculture
SD Department of Game, Fish, and Parks
US Fish and Wildlife Service
Ducks Unlimited
Pheasants Forever
World Wildlife fund

Objective 2: Transfer grassland management information to a minimum of 10,000 (10,000) South Dakota producers, 20 (20) researchers, 40 (40) grassland specialists and approximately 190,000 (190,000) other individuals.

Task 2: Complete information and outreach activities that promote and provide opportunities for involvement in grassland management and bring about an awareness of the water quality impact(s) of improved grassland management targeted towards 319 TMDL implementation project areas, riparian areas, and grasslands in southeast South Dakota.

Product 3: Existing web site maintained, farmer/rancher workshops, grazing schools, news releases and summer grazing tours.

Grassland management information transfer and outreach activities will include maintaining the project web site, rancher/farmer workshops, grazing schools, news releases, and grassland tours.

The primary target audience for grazing system planning and implementation outreach activities is information farmers/ranchers, resource managers, the research community and university students; the secondary the general public.

The web site hosted and maintained by SDACD, can be accessed at:

http://www.sdconservation.org/grassland/managing/gmd/index.html

Site features include:

- a journal describing demonstration site activities and
- links to other grazing information resources.

The project will use social marketing opportunities such as those available through *Facebook* to provide information to youth not associated with livestock based agriculture.

In partnerships with local organizations and agencies, grassland workshops will be held throughout the state, to include continuation of the successful summer birding tours. This project will also provide technical and financial assistance to continue the annual grazing school, summer grazing bus tours, and work with the print and electronic media (newspaper, magazine, TV, radio, etc.). In addition, this project will provide monitoring and evaluation materials such as grazing sticks and *Grasslands Plants of South Dakota and the Northern Great Plains* books to assist producers with their forage production and allocation as well as plant identification on the ranches and farms.

The quantities, milestones and cost of the activities are shown in Table 4.

Table 4. Information Transfer and Outreach Activities with Costs.

Activity	Milestone		Cost/Unit ($)	Total Cost ($)
	Contacts/Participants	Units		
Web site	100,000(100,000)	2 (2) years	200.00/year	400.00 (400)
Farmer/Rancher Workshops	180(180)	6(6)	2,000.00 (2,500)	12,000.00(15,000)
Grazing Schools	50(50)	2(2)	8,500.00 (9,000)	17,000.00(18,000)
Media Releases	96,000(96,000)	4 (4)	Project Staff	0.00
Leopold Conservation Award Tours	150 (150)	2(2)	3,000.00 (4,000)	6,000.00(8,000)
Grassland "Birding" Tours	100(100)	2(2)	2,000.00 (3,000)	4,000.00(6,000)
Total				39,400.00(47,000)

Activity team leader: Project Coordinator and Information Specialist/Outreach Coordinator

Milestones: See Table above

Total Cost – Task 2, Product 3: $40,000 ($47,000) **319 Cost: $10,000 ($22,000)**

RESPONSIBLE AGENCIES

Technical Assistance and Coordination:

Information Specialist/Outreach Coordinator
Project Coordinator
South Dakota Association of Conservation Districts

Planning Technical Assistance:

Information Specialist/Outreach Coordinator
Project Coordinator/Range Consultants
Natural Resources Conservation Service
SD Department of Agriculture
South Dakota State University
Conservation Districts
Demonstration Site Farmers/Ranchers

Information Transfer:
Information Specialist/Outreach Coordinator
Project Coordinator
SD Association of Conservation Districts
Natural Resources Conservation Service
South Dakota State University Cooperative Extension Service
Demonstration Site Farmers/Ranchers

Implementation:

Information Specialist/Outreach Coordinator
Project Coordinator
South Dakota State University
USDA Natural Resources Conservation Service
Demonstration Site Farmers/Ranchers
World Wildlife Fund

Financial Assistance:

Natural Resources Conservation Service
TMDL Implementation Projects
South Dakota State University
World Wildlife Fund

The second project goal is:

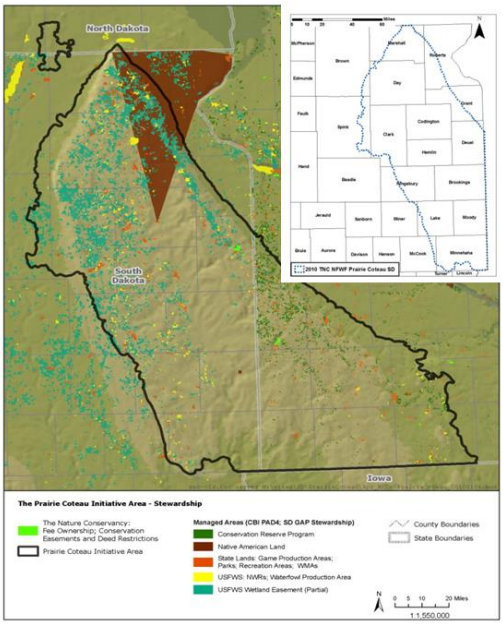
To develop standardized and repeatable methodology to assess South Dakotas remaining native grasslands that can be adapted to other regions of the great plains in order to measure impacts of grassland conversion on conservation of ranching, habitat, and watersheds.

Objective 3: Assess remaining native grasslands in South Dakota and portions of western Minnesota

Task 3: The South Dakota portion of the Prairie Coteau landscape was completed during June 2014 (Phase I) and are included in Table 2 below. Task 3 will be completed in phases and tracked as products 4-7 below. Each product is based on a specific geographic region with specific funding sources. The complete dataset is needed to address water quality concerns in broader watersheds.
Table 1. Phase I. South Dakota Prairie Coteau (completed June 2014 with federal TNC funds)

Table 1. Phase I. Minnesota Prairie Coteau

Phase I. South Dakota Prairie Coteau Landscape Area				
County	**Landcape/project area phase**	**State**	**Total county mi^2**	**mi^2 completed in SD Prairie Coteau Phase I**
Brookings	Prairie Coteau	SD	792	66
Clark	Prairie Coteau	SD	958	903
Codington	Prairie Coteau	SD	689	complete
Day	Prairie Coteau	SD	1,028	1,020
Deuel	Prairie Coteau	SD	623	620
Grant	Prairie Coteau	SD	681	345
Hamlin	Prairie Coteau	SD	507	complete
Kingsbury	Prairie Coteau	SD	832	557
Lake	Prairie Coteau	SD	563	507
Marshall	Prairie Coteau	SD	838	506
McCook	Prairie Coteau	SD	574	47
Miner	Prairie Coteau	SD	570	5
Minnehaha	Prairie Coteau	SD	807	736
Moody	Prairie Coteau	SD	519	complete
Roberts	Prairie Coteau	SD	1,101	316
Spink	Prairie Coteau	SD	1,504	231
	Totals		**12,587**	**5,859**

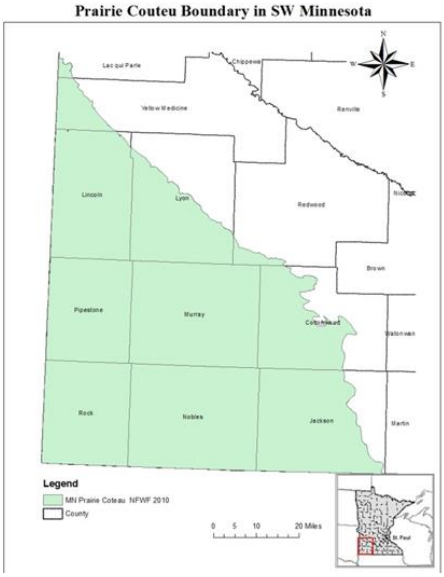


Product 4: Phase II results. Report to partners for 11 MN counties and distribution of GIS data layer for use in conservation planning, program planning, and grassland status assessments. (Previous SD counties included in this phase are recorded in Table I (Phase I) above.

Product 4 Cost: All costs for accomplishing task 3: product 4 (Minnesota Prairie Coteau) will be met through funding provided by the Minnesota Department of Natural Resources ($20,000).
Total Cost – Task 3, Product 4: ($20000 + fixed costs) **319 Cost: ($0)**

Table 2. Phase II. Minnesota Prairie Coteau

Phase II. Minnesota Prairie Coteau Landscape Area				
County	**Landcape/project area phase**	**State**	**Phase II to be completed MN Prairie Coteau mi^2**	**Est time to complete phase II MN Prairie Coteau(15 mi^2/hr)**
Lac qui Parle	Prairie Coteau	MN	12	1
Yellow Medicine	Prairie Coteau	MN	100	7
Redwood	Prairie Coteau	MN	34	2
Lincoln	Prairie Coteau	MN	543	36
Lyon	Prairie Coteau	MN	397	26
Pipestone	Prairie Coteau	MN	466	31
Murray	Prairie Coteau	MN	720	48
Cottonwood	Prairie Coteau	MN	371	25
Rock	Prairie Coteau	MN	483	32
Nobles	Prairie Coteau	MN	723	48
Jackson	Prairie Coteau	MN	571	38
	Totals		**4,420**	**295**



Product 5: Phase III results. Report to partners on 9 SD Missouri Coteau counties and distribution of GIS data layer for use in conservation planning, program planning, and grassland status assessments.

Product 5 Cost: All costs for accomplishing task 3, product 5 (South Dakota Missouri Coteau) will be met through funding provided by The Nature Conservancy ($20,000).
Total Cost – Task 3, Product 5: ($20,000+ fixed costs) **319 Cost: ($0)**

Table 3. Phase III. South Dakota Missouri Coteau

Phase III. South Dakota Missouri Coteau Landscape Area					
County	**Landcape/project area phase**	**State**	**Total county mi^2**	**Phase III to be completed Missouri Coteau mi^2**	**Est time to complete phase III Mo. Coteau (15 mi^2/hr)**
Campbell	Missouri Coteau	SD	734	257	17
Edmunds	Missouri Coteau	SD	1,126	794	53
Faulk	Missouri Coteau	SD	982	557	37
Hand	Missouri Coteau	SD	1,437	65	4
Hyde	Missouri Coteau	SD	861	247	16
McPherson	Missouri Coteau	SD	1,137	881	59
Potter	Missouri Coteau	SD	861	214	14
Sully	Missouri Coteau	SD	1,007	112	7
Walworth	Missouri Coteau	SD	709	56	4
	Totals		**8,852**	**3,183**	**212**

Product 6: Phase IV results. Report to partners on all or portions of 44 eastern counties and distribution of GIS data layer for use in conservation planning, program planning, and grassland status assessments.

Product 6 Cost: It is anticipated that all costs for accomplishing task 3, product 6 (remainder of eastern South Dakota) will be met through funding provided by various partners, including but not limited to SD NRCS ($35,000) and SD GF&P ($35,000).
Total Cost – Task 3, Product 6: ($70,000 + fixed costs) **319 Cost: ($0)**

Table 4. Phase IV. Remainder of eastern South Dakota

Phase IV. Completion of South Dakota East River Counties								
County	Landcape/project area phase	State	Total county mi^2	mi^2 completed in SD Prairie Coteau Phase I	Phase III to be completed Missouri Coteau mi^2	Est time to complete phase III Mo. Coteau (15 mi^2/hr)	Phase IV Remainder East River mi2	Est time to complete Phase IV Remainder East River (15 mi^2/hr)
Campbell	Missouri Coteau	SD	734		257	17	477	32
Edmunds	Missouri Coteau	SD	1,126		794	53	332	22
Faulk	Missouri Coteau	SD	982		557	37	425	28
Hand	Missouri Coteau	SD	1,437		65	4	1,372	91
Hyde	Missouri Coteau	SD	861		247	16	614	41
McPherson	Missouri Coteau	SD	1,137		881	59	256	17
Potter	Missouri Coteau	SD	861		214	14	647	43
Sully	Missouri Coteau	SD	1,007		112	7	895	60
Walworth	Missouri Coteau	SD	709		56	4	653	44
Brookings	Prairie Coteau	SD	792	66			726	48
Clark	Prairie Coteau	SD	958	903			55	4
Codington	Prairie Coteau	SD	689	complete			0	0
Day	Prairie Coteau	SD	1,028	1,020			8	1
Deuel	Prairie Coteau	SD	623	620			3	0
Grant	Prairie Coteau	SD	681	345			336	22
Hamlin	Prairie Coteau	SD	507	complete			0	0
Kingsbury	Prairie Coteau	SD	832	557			275	18
Lake	Prairie Coteau	SD	563	507			56	4
Marshall	Prairie Coteau	SD	838	506			332	22
McCook	Prairie Coteau	SD	574	47			527	35
Miner	Prairie Coteau	SD	570	5			565	38
Minnehaha	Prairie Coteau	SD	807	736			71	5
Moody	Prairie Coteau	SD	519	complete			0	0
Roberts	Prairie Coteau	SD	1,101	316			785	52
Spink	Prairie Coteau	SD	1,504	231			1,273	85
Aurora	East River	SD	708				708	47
Beadle	East River	SD	1,259				1,259	84
Bon Homme	East River	SD	564				564	38
Brown	East River	SD	1,713				1,713	114
Brule	East River	SD	817				817	54
Buffalo	East River	SD	471				471	31
Charles Mix	East River	SD	1,097				1,097	73
Clay	East River	SD	412				412	27
Davison	East River	SD	436				436	29
Douglas	East River	SD	432				432	29
Hanson	East River	SD	435				435	29
Hughes	East River	SD	742				742	49
Hutchinson	East River	SD	813				813	54
Jerauld	East River	SD	526				526	35
Lincoln	East River	SD	577				577	38
Sanborn	East River	SD	569				569	38
Turner	East River	SD	617				617	41
Union	East River	SD	461				461	31
Yankton	East River	SD	521				521	35
	Totals		**34,609**	**5,859**	**3,183**	**212**	**23,852**	**1,590**

Product 7: Phase V results. Report to partners on 22 western SD counties and distribution of GIS data layer for use in conservation planning, program planning, and grassland status assessments.

Product 7 Cost: It is anticipated that all costs for accomplishing task 3, product 7 (western South Dakota) will be met through this grant with matching contributions provided by funding partners as described in products 4-6.

Product 7 Total Cost: ($0 + fixed costs) **319 Cost: ($0)**

Products 4-7 have fixed costs associated with SDSU personnel who will perform these tasks. Total costs for Task 3 are as follows.

Task 3 Products 4-7 Total Cost: ($237,205) **319 Cost: ($127,205)**

Table 5. Phase V. Western South Dakota.

Phase IV. South Dakota West River Counties					
County	**Landcape/project area phase**	**State**	**Total county mi^2**	**Phase V West River mi^2**	**Est time to complete Phase V (15 mi^2/hr)**
Bennett	West River	SD	1,185	1,185	79
Butte	West River	SD	2,250	2,250	150
Corson	West River	SD	2,470	2,470	165
Custer	West River	SD	1,557	1,557	104
Dewey	West River	SD	2,302	2,302	153
Fall River	West River	SD	1,740	1,740	116
Gregory	West River	SD	1,015	1,015	68
Haakon	West River	SD	1,811	1,811	121
Harding	West River	SD	2,671	2,671	178
Jackson	West River	SD	1,864	1,864	124
Jones	West River	SD	970	970	65
Lawrence	West River	SD	800	800	53
Lyman	West River	SD	1,642	1,642	109
Meade	West River	SD	3,471	3,471	231
Mellette	West River	SD	1,307	1,307	87
Pennington	West River	SD	2,777	2,777	185
Perkins	West River	SD	2,870	2,870	191
Shannon	West River	SD	2,094	2,094	140
Stanley	West River	SD	1,444	1,444	96
Todd	West River	SD	1,389	1,389	93
Tripp	West River	SD	1,612	1,612	107
Ziebach	West River	SD	1,961	1,961	131
	Totals		**41,202**	**41,202**	**2,747**

RESPONSIBLE AGENCIES: Tasks 3, products 4-7.

Technical Coordination:
Range Field Specialist, SDSU Extension

Technical/Data Assistance:
SD Farm Services Agency
US Fish and Wildlife Service
SD Department of Game, Fish, and Parks
MN Department of Natural Resources
The Nature Conservancy
SD Natural Resources Conservation Service
South Dakota State University

Implementation:
Range Field Specialist, SDSU Extension

Financial Assistance:
SD Department of Game, Fish, and Parks
MN Department of Natural Resources
The Nature Conservancy
SD Natural Resources Conservation Service
South Dakota State University
South Dakota Grassland Coalition

Objective 4: Provide information on watershed modeling in eastern South Dakota.

Task 4: Provide information on modeling hydrologic and water quality impacts of grassland losses for 3 South Dakota watersheds in eastern, north central, and western South Dakota.

Product 8: Hydrologic and water quality metrics in three watersheds associated with grassland conversion in South Dakota. Task 7 will be accomplished by using the following procedure and resources.

- Data: Streamflow, precipitation, water quality, and land use are the major datasets that will be utilized for the analysis. More than 15 years of daily streamflow data measured near the outlets of the selected watersheds will be obtained from USGS observation stations for a period of 1995-2010. Climate data (e.g. precipitation and temperature) corresponding also to the study period for rain gage stations located in the study watersheds will be obtained from South Dakota Office of Climatology. Water quality data for sediment, total phosphorus (TP), nitrate-nitrogen (NO_3-N), and fecal coliform bacteria, collected at water quality stations within the watersheds, will be obtained from the South Dakota Department of Environment and Natural Resources (DENR) for the 1995-2010 study period. The land use maps to be used in the analysis will be a mixture of land use maps from the National

Land Cover Database (NLCD), quantified land uses (Reitsma et al., 2014), and hypothetical land uses (see "Simulation Scenarios" section below for further description on the land use maps).

- Watershed model: The analysis proposed in this study will use the Soil and Water Assessment Tool (SWAT; Arnold et al., 1998). SWAT is a process-based, distributed-parameter watershed scale model for simulation of long-term hydrologic and water quality impacts of various watershed management strategies (Arnold et al., 1998). The model has been widely used in many watershed scale studies (e.g. Gitau et al., 2004; Gassman et al., 2007; Chaubey et al., 2010; Cibin et al., 2012). SWAT divides the watershed into subwatersheds using watershed topographic information. During simulations, each subwatershed is treated as an individual unit. The subwatersheds are further partitioned into hydrologic response units (HRU) using land use, soil and slope information. The HRU is the smallest spatial unit that the model uses to simulate hydrologic, sediment, nutrient, and agricultural chemical yields. The model is capable for routing runoff and chemicals through streams and reservoirs with readily available input data (precipitation, temperature, solar radiation, relative humidity and wind speed). Other basic input data, besides weather, required for the SWAT model include topography, land use, soil and management information. It also allows addition of flows and inclusion of measured data from point sources. The major components of the model consist of weather, surface runoff, groundwater/baseflow, percolation, return flow, evapotranspiration (ET), transmission losses, pond and reservoir storage, reach routing, crop growth, irrigation, groundwater flow, nutrient and pesticide loads, and water transfer. Detailed description of the SWAT model components and representation of hydrologic and water quality processes is provided in Neitsch et al. (2005; 2009).
- Simulation scenarios: The SWAT model will be calibrated and validated using a split-time approach (Schilling et al., 2014) at monthly time-scale. The calibration and validation periods will be set to two non-overlapping periods, consisting of 1995-2002 and 2003-2010, respectively.
  To assess how changing grassland extent would influence streamflow and water quality in the in the study watersheds, a baseline scenario will be simulated with the calibrated model for a period of 1995-2010 (16 years). The baseline scenario will allow to have a reference case for comparison prior to performing "what if" scenario simulations. The following land use conditions will be evaluated in the selected watershed:
  - Baseline scenario: In this scenario, the existing land use condition in the watersheds will be evaluated with land use map extracted from NLCD and quantified grassland map (see Reitsma et al., 2014 and Bauman, 2014). Although many land use maps are currently available in NLCD, the 2011 national land cover dataset (http://www.mrlc.gov/nlcd2011.php) will be used in the proposed study to portray the latest existing land use condition in the watershed. Quantification of undisturbed grassland are described in a section above. All "what if" scenarios will be simulated with hypothetical land uses, which follow:
  - Hundred percent grass scenario: All of the cropland in the watershed will be converted to grass; we will assume grass at mature stage.
  - Fifty percent grass scenario: In this scenario, 50% of the cropland in the watershed will be grass and the other 50% will be the existing cropland condition.
  - Corn-grass scenario: 50% of the cropland in the watershed will be grass and the other 50% will be planned for corn.
  - Soybean-grass scenario: 50% of the cropland in the watershed will be grass and the other 50% will be soybean.
  - Alfalfa-grass scenario: 50% of the cropland in the watershed will be grass and the other 50% will be alfalfa.

- Upstream grass scenario: All of the cropland in upstream subwatersheds will be grass and the remaining watershed (central and southern portions) will be kept in the existing land use condition.
- Center grass scenario: All of the cropland in the central portion of the watershed will be grass and the remaining watershed (upstream and southern portions) will be kept in the existing land use condition.
- Downstream grass scenario: All of the cropland in the downstream portion of the watersheds will be grass and the remaining watershed (central and southern portions) will be kept in the existing land use condition.

In addition to the scenarios described above, time variant land use/land cover change scenarios will be evaluated to account for hydrologic and water quality impacts of undisturbed versus disturbed grassland. These scenarios include:

- Baseline scenario: All cropland in the watershed will be converted to mature grass.
- Corn-grass rotation: In this scenario, corn will be planted during the first 8 years of the simulation period (1995-2002), and grass will be kept during the last 8 years (2003-2010) on all cropland.
- Soybean-grass rotation: soybean will replace corn during the first 8 years of the simulation period (1995-2002), and grass will be kept during the last 8 years (2003-2010) on all cropland.
- Alfalfa-grass rotation: alfalfa will replace corn during the first 8 years of the simulation period (1995-2002), and grass will be kept during the last 8 years (2003-2010) on all cropland.
- Grass-crop rotation: Three scenarios will be designed to have corn, soybean, and alfalfa on all cropland during the last 8 years of the simulation period, and grass during the first 8 years.
- Grass-crop-grass rotation: Theses three scenarios will rotate grass and crop by using grass during the first 4 years (1995-1998), a crop during the following 8 years (1999-2006), and grass during the last 4 years (2007-2010). Corn, soybean, and alfalfa will be evaluated.
- Grass-crop-grass rotation: Three scenarios will implement grass the first 4 years of the simulation period, and rotate crop-grass every 2 years thereafter. Corn, soybean, and alfalfa will also be used, respectively, in each scenario.

- Statistical analysis: Tukey pairwise comparison tests will be used to evaluate differences between mean annual surface runoff, streamflow, losses in sediment, TP, NO_3-N, and fecal coliform bacteria associated with land use scenarios within each watershed.

Milestones:

- Data compilation
- Model set up
- Model calibration and validation
- Scenario simulations
- Interpretation of results
- Final report

Total Cost – Task 7, Product 8: ($95,891) **319 Cost: ($55, 891)**

RESPONSIBLE AGENCIES: Tasks 7.

Technical Coordination:
Grassland Hydrologist, SDSU Department of Ag. & Biosystems Engineering

Technical/Data Assistance:
See description of resources in Task 7.

Implementation:
Grassland Hydrologist, SDSU Department of Ag. & Biosystems Engineering
Graduate Research Assistant, SDSU Department of Ag. & Biosystems Engineering

Financial Assistance:
South Dakota State University
South Dakota Grassland Coalition

Objective 5: Monitor and evaluate project progress in relation to meeting established milestones and attaining the project goal.

Task 8: Monitor project activities and file reports as outlined in the project implementation plan to determine compliance with grant and contractual agreements, memoranda of understandings, reporting requirements, and the SDGLC by-laws.

Product 9: Annual and final reports

Monitoring of project progress, evaluation of data collected and reporting will be completed by the project coordinator and SDACD as outlined in the association's agreement with SDGLC and described in the monitoring sand evaluation section of this application.

The information collected will be used to complete annual (October) and final reports and provide progress updates to SDGLC's project partners.

Annual reports will be prepared by the project coordinator using the electronic format provided by DENR to facilitate entry into GRTS. The reports will include:

- a cumulative summary and evaluation of activities completed relative to project milestones and progress toward attaining the project goal,
- information regarding amendments to the project implementation plan (PIP)
- a discussion of problems encountered and actions taken to address the challenge, and
- estimates of load reductions realized calculated using STEPL.

The final report will be prepared in the format provided by DENR and submitted to the department electronically.

Milestones:

- Annual reports - 2
- Final report - 1

Total Cost: $7,265 ($7,500) **319 Cost: $5,000 ($7,500)**

RESPONSIBLE AGENCIES

Coordination:

Project Coordinator
South Dakota Association of Conservation Districts
South Dakota Grassland Coalition
South Dakota Department of Environment and Natural Resources

Implementation:

Project coordinator
Grassland managers/producers,
SDSU, Animal and Range Science Department staff (Outreach Coordinator)
Project partners
SDGLC Board of Director's members

Financial Assistance:

Grassland Management and Planning Project – 319 Grant

3.3 Milestone Table

See Attachment A. Grasslands Segment 4 Extended Milestones

3.4. Required Permits

Permits and clearances required to install the practices selected to develop a managed grazing system will be identified during the planning process. The permits and clearances will be obtained by the agency or organization providing implementation technical assistance prior to installation of the practices.

Permits and clearances that may be required include:

- Section 401 and 404 permits for shoreline and riparian BMP installation,
- Section 402 stormwater construction permit if construction will disturbs 1 acre or more or is located near to a waterbody,
- State Historical Preservation Office clearance for any BMPs involving ground disturbing activities and

- Threatened and endangered species habitat/presence determinations and compliance with the requirements identified in the clearance EPA completed for this project through consultation with the USFWS.

3.5. Lead Sponsor and Why

The SD Grasslands Coalition is the project sponsor. A summary of accomplishments that support the coalition continuing as the lead project partner follows.

The South Dakota Grassland Coalition has:

- developed partnerships with a broad spectrum of individual, organization and agency stakeholders interested in grassland management in South Dakota and the surrounding states and
- provided the leadership that lead to the successful completion four Section 319 project grants (FFY 1999, 2001, 2007 and 2013).

Public and private stakeholder partnerships represented by "interest" category include:

Wildlife and Conservation:

- Ducks Unlimited,
- SD Ornithological Society
- Sand Country Foundation
- The Nature Conservancy
- Pheasants Forever
- World Wildlife Fund

Grazing Lands Societies and Livestock Industry:

- SD Chapter of the Society for Range Management,
- SD Cattlemen's Association
- Nebraska Grazing Lands Coalition
- North Dakota Grazing Lands Coalition

Local Conservation/Water Quality Programs:

- Local conservation districts,
- Belle Fourche River Partnership,
- TMDL Implementation Projects
- SD Association of Conservation Districts

Governmental:

- South Dakota State University Department of Natural Resource Management, Cooperative Extension Service, and Geographic Information Science Center of Excellence

- Lower Brule and Crow Creek Sioux Tribes
- SD Departments of Agriculture; Game, Fish and Parks; and Environment and Natural Resources,
- Natural Resource conservation Service
- US Fish and Wildlife Service
- SD Governor's Pheasant Habitat Work Group
- Minnesota Department of Natural Resources
- SD Farm Services Agency
- MN Farm Services Agency

SDGLC's leadership in promoting grasslands issues and environmental protection is recognized beyond the boundaries of SD. The coalition:

- was the recipient of the 2007 USDA NRCS Excellence in Conservation and EPA Region 8 Environmental Achievement Awards and
- has assisted with the selection of the Sand Country Foundation's SD Leopold Conservation Award honoree since 2010.
- Has collaborated with grazing coalitions in North Dakota, Minnesota, and Nebraska and conservation organizations such as The Nature Conservancy and World Wildlife Fund.

3.6. Maintenance and Operations Roles and Responsibilities

Project activities planned are primarily directed toward technical assistance for the development of managed grazing systems and providing the training livestock producers and resource managers need to successfully operate the systems and information transfer. Project staff refers the producers to other service providers for the financial and technical assistance associated with the installation of the conservation practices identified during the planning process.
Producers that install the practices are required to enter an agreement that outlines operation and maintenance (O & M) responsibilities of the producer and agency or organization providing the assistance. The practice and its components will be maintained by landowners based on *the Natural Resources Conservation Service Technical Guide* length of life practices guidelines.

Ownership of and/or control monitoring of equipment acquired by SDGLC by purchase, lease or loan from other project partners will remain with the partner organization funding purchase unless otherwise specified by a contractual agreement or memorandum of understanding.

4.0. Coordination Plan

The Grasslands Management and Planning project was developed by a partnership that included producers and local, state and federal agencies and organizations. Partnerships were solidified and expanded during the completion of three subsequent project segments. The proposed fourth project segment will offer additional stakeholders the opportunity to become part of the partner's cooperative efforts to address water quality by promoting environmentally sound grassland management in SD.

This fourth project segment expands the scope of the conservation and environmental protection work and reputation previously established by the SDGC. Specifically, the SDGC will now increase its scope

of work with additional focus on determining the area and location of South Dakota's remaining native grassland resources in order to assist producers and partner organizations in improved management and enhancement of this diminishing resource. Further, through the watershed modeling component of this project, SDGC will have improved information for public distribution concerning the landscape-level effects that conversion of remnant native grassland can have on watersheds and water quality.

The Grassland Coalition's financial and technical assistance partners are listed below. The partners have indicated that t contribution(s) made during past project will continue is indicated.

PROJECT PARTNERS AND RESPONSIBILITIES

South Dakota Grassland Coalition:

The SD Grassland Coalition is the project sponsor. The Coalition will provide leadership for project management, coordination, and administration. See section 3.5 for information summarizing why the coalition is the appropriate entity to provide leadership for the implementation of the project workplan.

Most project partnerships are not contractual. Many do not involve contributions of financial assistance that are included in the project budget. For example, the partnership with the:

1. Sand Country Foundation's Leopold Conservation Award recognizes families who "keep their operation economically and environmentally sustainable". Currently nine states participate in the program. The award is given to one ranch in each participating state each year. The winner receives a Leopold Crystal, a ranch sign and a $10,000 cash prize.

   The South Dakota Cattlemen's Association and the SD Grasslands Coalition are sponsors for the award given in South Dakota. The funds do not pass through the project budget. Financial and other contributors include:

American Bank & Trust	Belle Fourche River Watershed Partnership
Bradley Fund for the Environment	Daybreak Ranch
Ducks Unlimited, Inc.	DuPont-Pioneer
Farm Credit Services of America	Mosaic Company
Millborn Seeds	Mortenson Family
NRCS	Professional Alliance
SD DENR	South Dakota Conservation Districts
SD Dept. Of Ag-Resource Conservation & Forestry	
SD Discovery Center	SD Farm Bureau Federation
SD Game Fish & Parks	SD Grasslands Coalition
SDSU Foundation	The Nature Conservancy
US FWS-Partners for Fish & Wildlife	World Wildlife Fund

   For more information regarding the award access:

   http://leopoldconservationaward.org/states

2. SD Chapter of the Society for Range Management, SD Cattleman's Association, Ducks Unlimited, SD GFP and Crow Creek Sioux Tribe promote the involvement in/or provide funds for the installation of practices used to install managed grazing systems.

Additional project partner contributions that directly impact the completion of project related tasks are summarized in the Table 5.

Table 5. Project Partners Contributions.

Agency/Organization	Contribution
Nongovernmental	
Nebraska Grazing Lands Coalition	Range and Pasture Journal publication partner
SD Association of Conservation Districts	Contractual services for administration, accounting services and web site host and maintenance; liaison to conservation districts; provide, train and supervise project staff and TSPs using project and Farm Bill Implementation Technical Assistance funds provided by NRCS.
Local land Owners	Grazing school Field Exercise location
SD Ornithological Society	Organize and host field days that promote managed grazing as a BMP that supports avian diversity and habitat.
Governmental	
Local	
Belle Fourche River Partnership	Technical assistance for grazing system planning in the Belle Fourche River TMDL Implementation Project Area
Conservation Districts	Local contact for livestock producers; outreach and information transfer; technical assistance for BMP planning and installation.
TMDL Implementation Projects	Local contact for producers; outreach/information transfer and BMP planning and installation technical assistance.
The Nature Conservancy	Financial assistance and data resources for untilled sod (native grass) mapping project, Phase III: SD Missouri Coteau $20,000.
State	
SD Department of Agriculture	Financial assistance for BMP installation and technical assistance to conservation districts.
SD DENR	Technical assistance and training for project management and staff; BMP installation and water quality sampling and data interpretation through the 319 Program.
SDSU and SDSU Cooperative Extension Service	Contractual services for a portion of an FTE to coordinate/assist with information transfer and the grazing schools; management and coordination of demonstration sites; contact point for producers. General oversight, coordination, and management of both the untilled sod (native grass) mapping project and the watershed modeling projects.
South Dakota Department of Game, Fish, and Parks	Financial assistance and data resources for untilled sod (native grass) mapping project, Phase IV: eastern SD. $35,000.
Minnesota Department of Natural Resources	Financial assistance and data resources for untilled sod (native grass) mapping project, Phase II: Minnesota Prairie Coteau. $20,000.
Federal/Tribal	

US EPA	Financial assistance through DENR's Section 319 project grants.
USDA FSA	Financial assistance for BMP installation through the CRP Program.
USDA NRCS	Financial and technical assistance for BMP planning and installation through the EQIP and Farm Bill Implementation Technical Assistance funds provided to SDACD. Financial assistance and data resources for untilled sod (native grass) mapping project, Phase IV: eastern SD. $35,000.
USDI FWS	Technical and financial assistance for grassland seeding, grazing systems, multiple purpose ponds and riparian fencing through the Partners for Fish and Wildlife Program.
SD Farm Services Agency	Common Land Unit data
MN Farm Services Agency	Common Land Unit data

4.2. Support

Local and resource management agency and organization support is indicated by the:

- ranchers who serve on the Grassland Coalition Board of Directors,
- demand for project services by landowner and
- financial and technical assistance partnerships developed that have contributed to the ongoing success of the project.

4.3. Coordination with Other Programs

The completion of the Grassland Management and Planning PIP will be accomplished through partnerships with local, state and federal agencies and organizations. Financial and technical assistance for the installation of the grassland management practices planned will be completed using cost share programs. Examples of resource coordination include but are not limited to partnership with the:

- Natural Resources Conservation Service – funds for planning and installation of practices through the Farm Bill Implementation Technical Assistance and EQIP programs and access services available through the agency's information specialists,
- Conservation Districts - technical assistance and information networks and implementation assistance through the SD Soil and Water Conservation Fund,
- South Dakota Association of Conservation Districts – project management assistance and host the project web site,
- South Dakota Department of Game, Fish and Parks and the US Fish & Wildlife Service - funding for water development and fencing,
- Ducks Unlimited – financial assistance for practice installation,
- South Dakota State University – project information specialist/outreach coordinator services by a Range Science staff member, grassland mapping staff, watershed modeling staff, and
- SD Governor's Pheasant Habitat Work Group

Additional programs and project partners are identified in Section 4.0 of this application. For a more detailed description of coordination with other agencies and programs access:
http://denr.sd.gov/dfta/wp/wqprojects/grasslandseg2fnlrpt.pdf

4.4. Non-Duplication of Effort

Project activities selected to provide technical assistance to grassland managers and grassland management information and training opportunities were identified by the sponsor's project partners.

The sponsor and project staff will serve as the primary grassland technical assistance provider to existing Section 319 projects, and coordinate assistance offered by its project partners to maximize and accelerate the delivery of grassland technical assistance.

5.0. Evaluation and Monitoring

Success of project activities both as individual actions and in attaining the project goal will be evaluated based on monitoring project activities. Monitoring activities will track:

- milestone accomplishment in relation to planned,
- outcome(s) realized from project activities in relation to the intended purpose,
- effects on water quality and vegetation parameters as evidenced by load reductions realized using STEPL and change in ecological condition respectively,
- contributions to improving sustainability of grassland managers' operations as evidenced by information provided by ranchers who attend grazing schools and antidotal information provided by operators who have installed systems and
- responses to questionnaires distributed at the end of each tour, workshop or grazing school to determine changes to the outreach program or a specific activity that may be needed as well as and assessing the effectiveness of the activity an action that supports attaining the project goal.
- Use of native grassland and watershed modeling data and results in partner conservation program planning and implementation.

Project monitoring will be completed by a team consisting of:

- the project coordinator,
- grassland managers/producers,
- SDSU, Animal and Range Science Department staff (Outreach Coordinator),
- project partners and
- SDGLC Board of Director's members.

The information collected will be used to complete annual (October) reports of project activities, and provide project progress updates to all project partners and funders. A final report will be completed at the end of the project.

Annual reports will be prepared by the project coordinator using format provided by DENR to facilitate entry into GRTS. The reports will include:

- a cumulative summary and evaluation of activities completed relative to project milestones and progress toward attaining the project goal,
- information regarding amendments to the PIP
- a discussion of problems encountered and actions taken to address the challenge, and
- estimates of load reductions realized calculated using STEPL.

The final report will be prepared in the format provided by DENR and submitted to the department electronically.

5.1. Project Monitoring Plan

Data used to track the sources and uses of project finances, prepare reports and evaluate project success relative to accomplishment in relation to the milestone schedule and goal attainment will be collected and interpreted by activity category. The data will be entered in the DENR electronic project management program to facilitate report preparation. The categories for which data that will be collected and the responsibility for collection and interpretation follow.

1. Project Administration

   Project administration will be monitored by SDGLC Board of Directors by:

   - reviewing financial records provided by SDACD and entered in the DENR Project Management Program (Tracker),
   - tracking the completion of project tasks as specified in the PIP,
   - considering input provided by project partners and project participants and
   - reports to the SDGLC Board of Directors by the project coordinator and SDACD.

2. Assistance Activities

   The project coordinator will collect data to evaluate the development and implementation of grassland management plans, mapping project progress, and modeling project progress by monitoring the:

   - number of on-farm visits and landowner/operator contacts,
   - number and acres of management plans developed by county,
   - number and acres of grassland management plans implemented by county,
   - load reductions realized from BMPs installed using STEPL,
   - conservation practices and units of each used to implement a grassland management plan,
   - location of operations assisted and demonstrations sites using GPS and
   - financial data to track the source and use of cash and inkind funds expended to plan and implement grassland management plans.
   - County map completions of untilled sod, data layer sharing, and reports
   - Watershed modeling completion reports

3. Information Transfer and Education

The project coordinator will collect and organize report data provided by the outreach coordinator and other project partners. Information that will be collected includes:

- attendance at tours, workshops and grazing schools,
- responses to questionnaires returned after each tour, workshop or school,
- number of visits to the project web site and producer/public web questions/comments and
- media releases/events by type (TV, radio, newsprint), topic, and estimated coverage or outreach by the release/event.
- Native grassland mapping reports, including distribution, location, and acreage
- Watershed modeling reports, including impacts of loss of remnant grasslands in relation to water quality, erosion, and flooding.

6.0. Budget

PART 1: FUNDING SOURCES

Funding Source By Year	July 2013 - June 2014	July 2014 - June 2015	Original Budget	July 2015 - June 2016	July 2016 - June 2017	Budget Extension	Total
EPA SECTION 319 FUNDS	$100,500	$100,500		$231,039	$231,039		
319 Subtotal			**$201,000**			**$462,077**	**$663,077**
OTHER FEDERAL FUNDS							
1.) NRCS (FA)	$98,687.50	$98,687.50	$197,375	$87,500	$87,500	175,000	
3.) NRCS-Mapping (FA)		$35,000	$35,000				
Federal Subtotal			**$232,375**			**$175,000**	**$407,375**
STATE FUNDS							
CWSRF	$57,500	$57,500	$115,000				$115,000
GF&P, Dept of Ag & DENR (FA/TA)	$37,050	$37,050	$74,100	$57,050	$57,050	$114,100	$223,220
GFP-Mapping		$35,000	$35,000				
SDSU (FA/TA)				$20,000	$20,000	$40,000	
MN DNR (FA)		$20,000	$20,000				
State Subtotal			**$244,100**			**$154,100**	**$398,200**
LOCAL FUNDS	$73,700	$113,700		$81,200	$81,200		
Grassland Coalition/CD (TA)	$2,500	$2,500	$5,000	$2,500	$2,500	$5,000	
Private Organizations (TNC/DU/ Other)	$2,500	$42,500	$45,000	$2,500	$2,500	$5,000	
Landowners (Cash /Inkind)	$68,700	$68,700	$137,400	$76,200	$76,200	$152,400	
Local Subtotal			**$187,400**			**$162,400**	**$349,800**
Matching Subtotal			**$431,500**			**$316,500**	$748,000
Total			**$864,875**			**$953,577**	**$1,818,452**

FA – Financial Assistance TA – Technical Assistance

Part 2: Detailed Budget.

See Attachment B. Grasslands Segment 4 Extended Budget.

8.0 Threatened and Endangered Species

Procedures that will be followed to ensure the project will promote the recovery of threatened and endangered species and will not adversely affect the species are based on three main premises:

1. managed grazing systems planned and implemented will promote the restoration or preservation of critical grassland habitat,
2. while the project will be implemented on a statewide basis, with first priority for assistance directed to water quality project areas, many of the grazing systems planned and implemented will be in areas for which threatened and endangered species consultation has been completed, and
3. NRCS and the US FWS involvement in planning and installing grazing systems ensures personnel trained with the recovery of threatened and endangered species will be involved with the design and implementation of practices completed to install the BMP.

Threatened and endangered most likely to be encountered during the project and the procedure to be followed relative to each species are:

1. Bald Eagle

   Project activities that disturb possible nesting sites or reduce food sources are not planned. If any actions become necessary that might impact bald eagle(s) that are in or might visit the project area, the sponsor or its agent will contact DENR for approval to complete the action before proceeding.

2. Whooping Crane

   If a whooping crane or cranes are observed at any project work site, all mechanical activities at the site will be suspended until the bird(s) leave the site under their own volition. Migration of the species through the state occurs during mid to late April and mid to late October.

3. Topeka Shiner

   In stream activities are not planned. Most riparian practices implemented are management rather than construction in nature.

   However, some practices such as streambank stabilization, and activities undertaken to maintain or improve meanders and install a multipurpose dam may require construction along or in a stream. In these instances, the project sponsor will work closely with the USFWS during site evaluation; design and construction to ensure that installing the BMPs do not adversely affect the species.

4. Black Tailed Prairie Dog

The Black Tailed Prairie Dog is a candidate species for listing under the Threatened and Endangered Species Act. Activities implemented as part of the project will comply with the State of South Dakota Prairie Dog Management Plan adopted during 2005. A copy of the plan is available by accessing:

http://gfp.sd.gov/wildlife/docs/prairiedog-management-plan.pdf

5. Black Footed Ferret

   The existence of Black Footed Ferrets (BFF) is directly linked to the presence of prairie dogs. The sponsor will:

   - comply with the SD Prairie Dog Management Plan, and
   - consult with the USFWS relative to the need for a BFF survey if actions are planned that may adversely effect the survival of a native or introduced population of BFF.

   The three demonstration sites installed before but included in this project are in areas blocked cleared by USFWS for BFF surveys.

6. Pallid Sturgeon
   Most riparian activities included in the project workplan are management rather than construction in nature, and therefore will not affect Pallid Surgeon habitat or population(s). None of the three demonstration sites installed prior to but included in this project are adjacent to water bodies that contain the species. See previous question regarding demo sites.

7. Poweshiek skipperling and Dakota Skipper butterflies
   The U.S. Fish and Wildlife Service listed the Dakota skipper as threatened and the Poweshiek skipperling as endangered under the Endangered Species Act on October 22, 2014. The U.S. Fish and Wildlife Service also proposed designating critical habitat for both prairie butterflies. These butterflies are primarily found within the Prairie Coteau portions of eastern South Dakota and western Minnesota. While the mapping and watershed modeling portions of the project will include focus on this region, no physical activity will be undertaken with these projects that would impact these species in any way. However, results of the both the untilled sod mapping and watershed modeling project could provide significant information that could be employed in the long-term conservation efforts of these two species, as well as many other native-prairie endemic species.